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A rare cause of chronic back pain: Elastofibroma dorsi

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Abstract

Aim: In this study, we aimed to retrospectively evaluate the symptoms, functions, and outcomes of patients who underwent surgery in our clinic for the diagnosis of Elastofibroma dorsi between 2007 and 2019.

Material and Methods: A total of 19 patients operated on in our clinic for the diagnosis of Elastofibroma dorsi (ED) were evaluated in respect of demographic characteristics such as age and gender, symptoms, clinical findings, diagnostic and radiological features, surgical procedures, results of surgical treatments, and postoperative follow-up results.

Results: The patients comprised of 13 females and 6 males with the mean age of 55.7 years. The most common clinical complaint was swelling (53.3%). EDs were located on the right side in 7 cases, on the left side in 3, and bilaterally in 7. In all cases, the mass was > 5 cm in diameter. Complete surgical excision was applied using the muscle-sparing technique. All patients were followed up postoperatively, and there was no recurrence.

Discussion: ED should be considered in the differential diagnosis when middle-aged patients present with a mass in the scapular region and shoulder pain. Total excision is surgically sufficient in symptomatic patients.

Keywords

Elastofibroma dorsi; Shoulder pain; Chronic back pain

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Introduction

Elastofibroma dorsi is a benign, rarely seen, slow-growing soft tissue lesion. First described by Jarvi and Saxen in 1961, the lesion is usually located at the inferior angle of the scapula, deep to the serratus anterior, and may be attached to the periosteum of the ribs [1]. Although the etiology is not clearly known [2], common symptoms are chronic back pain, stiffness, swelling, snapping of the scapula, and increased pain during shoulder movement. Non-invasive imaging methods such as ultrasonography, computed tomography, and magnetic resonance imaging are used in the diagnosis of elastofibroma dorsi [3]. Total excision is the best treatment to prevent relapses and relieve symptoms [4]. This paper, presents the experience of a single centre in the diagnosis and treatment of elastofibroma dorsi patients between 2007 and 2019.

Material and Methods

Approval for this study was granted by the Clinical Research Ethics Committee of Antalya Training and Research Hospital (decision no:1/8, dated: 9/01/2020). A retrospective review of 19 patients operated on for a diagnosis of elastofibroma dorsi in the period from 2007 to 2019 was carried out. The cases were evaluated in terms of age, gender, complaints, clinical findings, diagnostic and radiological features, surgical applications, surgical treatment results, and postoperative follow-up results. Radiological examinations were made using ultrasonography, thorax computed tomography (CT), and magnetic resonance imaging (MRI). In all cases, the mass diameter was measured on radiological evaluation. None of the cases were directly diagnosed by biopsy. With the pre-operative consent of the patients, surgical excision was applied in all cases using a transverse or parabolic incision at the inferior pole of the scapula. All operative samples were sent for histopathological evaluation and all cases were followed up for 6 months postoperatively.

Results

The cases comprised of 13 females (69%) and 6 males (31%) with the mean age of 55.7 years (range, 31-68 years). The most common clinical complaint was swelling (53.3%). Other complaints were chronic back pain (26.6%), snapping of the scapula (10%), and increased pain with shoulder movement (10%). The mean duration of symptoms was 20 months (range, 3 -96 months). The lesion was located in the subscapular region in all the patients; unilateral in 10 and bilateral in 9. Of the unilateral tumors, lesions were located on the left side in 3 cases and on the right in 7 (Table 1). Radiological examination with ultrasonography and thorax computed tomography (CT) was applied to all patients (Figure 1). Magnetic resonance imaging was applied in 7 cases that could not be evaluated adequately with thorax CT.

In all cases, total surgical excision of the lesion was performed using the muscle-sparing technique. A Hemovac drain was placed in the subscapular area and the layers were closed anatomically. The drain was then removed after 24-72 hours. All excised samples were sent for pathological examination. In the pathological examination, solid lesions with a yellow and white cross-section surface covered with fibrous capsule and containing adipose tissue were observed macroscopically (Figure 2). In the microscopic examination of hematoxylin-eosin-stained sections, mature adipocytes and elastic fibrils were seen to be stained positive with Van Gieson.

Postoperative complications developed in 4 of the operated cases (21%); antibiotic allergy in 1 (5%) and seroma requiring needle aspiration in 3 (16%). The mean length of hospital stay was 4 days (range: 2 – 8 days) and the mean follow-up was 5 months (range: 3 months-2 years). No recurrence was observed during the follow-up period.

Table 1. Demographic characteristics and results of patients operated for elastofibroma dorsi

Case	Age	Gender	Localization	Complaint	Preop bx	Recurrence	Complication
1.	63	M	R	SS/M	_	_	SEROMA
2.	61	F	BIL	CBP	_	_	_
3.	53	F	R	CBP/M	_	_	_
4.	62	M	L	M/SS/CBP	_	_	_
5.	35	F	R	M	_	_	_
6.	55	M	R	SMP	_	_	_
7.	51	F	BIL	SMP/M	_	_	_
8.	31	M	BIL	M/CBP	_	_	SEROMA
9.	51	F	BIL	CBP	_	_	SEROMA
10.	53	F	BIL	CBP/M	_	_	_
11.	59	F	BIL	CBP/M	_	_	_
12.	61	F	L	M	_	_	ANTIBIOTIC ALLERGY
13.	68	F	R	M	_	_	_
14.	54	F	BIL	CBP/M	_	_	_
15.	53	F	BIL	M	_	_	_
16.	61	F	BIL	M/SS	_	_	_
17.	65	M	R	M/SMP	_	_	_
18.	67	M	R	M	_	_	_
19.	56	F	L	M	_	_	_

M: Male, F: Female, R: Right, L: Left, BIL: Bilateral, CBP: Chronic Back Pain, M: Mass, SS: Snapping of Scapula, SMP: Shoulder Movement Pain

Discussion

Elastofibroma dorsi is a benign, unencapsulated, slow-growing soft tissue tumor that usually occurs in females, in the 5th and 6th decades of life. It was first described by Jarvi and Saxen in 1961 [1]. Although it is traditionally considered to be rare, in a series of 235 postmortems in patients older than 55 years, Jarvi and Lansimies showed changes in the subscapular thoracic fascia similar to elastofibroma in 24.4% of females (29/119) and in 11.2% of males (10/89) [5]. The age and gender of the patients in the current series were consistent with the literature. ED is often localized in the subscapular region, between the rhomboid and latissimus dorsi muscles and the sixth and eighth ribs. However, other localizations such as deltoid muscle, foot, greater trochanter, olecranon, cornea, stomach, greater omentum, ischial tuberosity, intraspinal space and chest wall have been reported in the literature [2,6,7].

ED is often unilateral and right-sided. Bilateral cases, which may be synchronous or asynchronous constitute approximately 10-60% [8]. In the current study, the lesion was located in the

Figure 1. The lesion was located in the subscapular region.

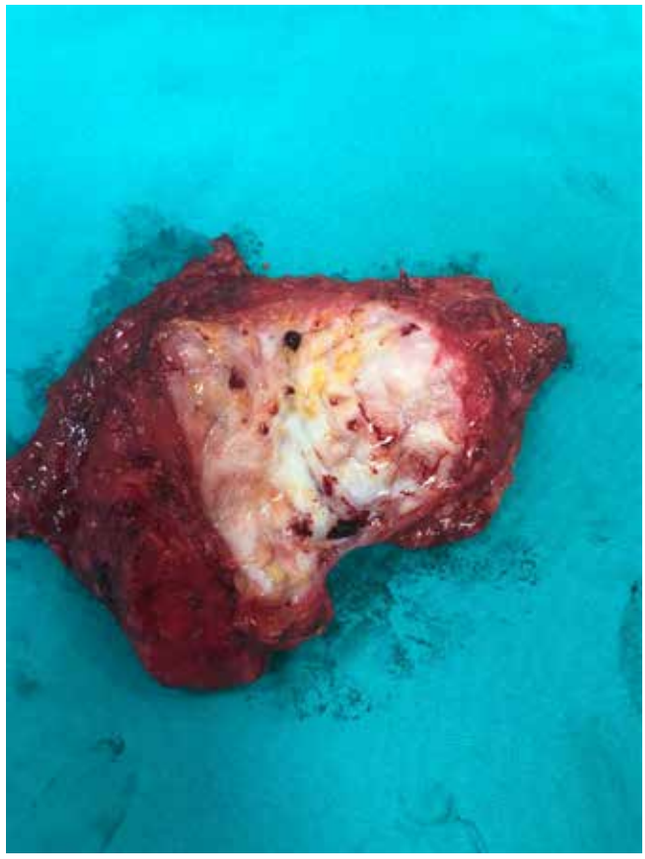

Figure 2. Solid lesions were observed with a yellow and white cross-section surface covered with fibrous capsule and containing adipose tissue

subscapular region in all the patients; unilateral in 10 (52.7%) and bilateral in 9 (47.3%). Of the 28 ED lesions, 16 were localized on the right side (57.1%). In patients with bilateral ED, the lesions were detected to be synchronous.

The pathogenesis of ED is not clear, and several hypotheses have been put forward. Repeated micro-injuries between the chest wall and the scapula, the source of excess elastin production, and collagen degeneration could play a role in the physiopathology of this rare lesion [9].

This view has been supported by the higher ED prevalence, particularly among individuals engaged in hard manual labour. However, the presence of elastofibromas in different locations and in patients who have never been involved in hard manual work has undermined this view. In the current study, 3 patients (15.7%) were manual labourers, and the remainder had no history of strenuous work or sporting activities.

In a study investigating genetic anomalies in ED cases, changes in DNA copy number were observed in tumor tissue, mainly in the chromosome Xq12-q22 and 19 regions [10]. In a cytogenetic study by Mc Comb et al., genetic instability was detected in chromosome number 1 and translocation in numbers 8-12, and it was stated that they may be neoplastic, not reactive, due to these clonal abnormalities. In the largest reported series of 170 patients with the lesion, a familial predisposition was suggested, as 32% had a positive family history of elastofibroma [8]. In the current study, none of the patients had a family history of ED.

There are also opinions that ED may be due to reactive fibromatosis, degeneration due to vascular insufficiency, elastotic degeneration and enzyme defect [8].

Clinical findings are mostly related to the size of the lesion. They often grow slowly and are asymptomatic. As the lesion grows, swelling in the back develops with chronic back pain, increased pain with shoulder movements and snapping of the scapula [11]. In the current series, the most common clinical complaint was swelling (53.3%) and 26.6% of the cases reported chronic back pain.

Imaging modalities for diagnosis include ultrasonography, CT and MRI. Solivetti et al. reported that the use of diagnostic USG is an adequate and inexpensive method [12]. Kransdorf et al. reported that radiological evaluation with MRI or CT is compatible with histopathological evaluation [13]. MRI is considered the most important imaging modality. Malghem et al. reported that fibrous tissues within the mass have similar signal characteristics with the surrounding muscle tissues in the MRI examination, while fat tissue has higher signal characteristics than the mass, and these findings are pathognomic for the mass [14]. In the current study, the radiological examination was applied with ultrasonography and thorax CT to all patients. MRI was applied in 7 cases that could not be evaluated adequately by thorax CT. The radiological findings of the current series were compatible with the literature.

Lipoma, neurofibroma, metastatic lesion, primary or metastatic sarcoma, fibrosarcoma, synovial sarcoma, and desmoid tumor should be considered in the differential diagnosis. Needle aspiration or incisional biopsy may be performed to eliminate the possibility of malignancy. However, excisional biopsy is often preferred, as a diagnostic radiological evaluation is usually sufficient [15,16]. No needle biopsies were performed in the current series.

Macroscopically, ED is a form of a non-encapsulated fibrous lesion of dirty white color with streaks of fat tissue. Some elastofibromas may have cystic degeneration. The typical histological appearance of the lesion is typical: large areas contain hyalinized collagenous stroma with small amount of fat tissue in between. In hypocellular collagenous stroma, fibrils

and globules that show eosinophilic staining are striking. In sections stained with hematoxylin-eosin, fibrils and globules are important for determination of the location of the lesion and its diagnosis [4,9].

Elastofibroma dorsi is treated with total excision, but surgery is not recommended for asymptomatic lesions smaller than 5 cm [17-19]. In the current series, the mass in all cases was >5 cm in diameter, thus complete surgical excision was performed with the muscle-sparing technique that requires preparation of latissimus dorsi and serratus anterior muscle flaps.

The most common complications after surgical excision are hematoma or seroma. Therefore, after excision of the mass, the bleeding control should be performed cautiously [11]. In this study, hemovac drainage and a compression bandage were used to reduce these complications. Postoperative complications developed in four of the operated cases (21%); in one case (5%), antibiotic allergy was observed and in three cases (16%), seroma requiring needle aspiration was observed.

Local recurrence after total excision is rare and malignant transformation has not been reported. In the first recurrence, total surgical excision can provide cure, but in subsequent recurrence, total excision may not be performed [9]. In the current study cases, no recurrence was detected during the follow-up period.

In conclusion, ED should be considered in terms of differential diagnosis when middle-aged patients present with a mass in the scapular region and shoulder pain. Total excision is surgically sufficient in symptomatic patients.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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